ARGUMENTS/REMARKS

Applicants would like to thank the examiner for the careful consideration given the present application, and for the personal interview conducted on April 27, 2010. The application has been carefully reviewed in light of the Office action and interview, and favorable reconsideration of the subject application is requested in view of the comments and/or amendments made herein.

Claims 35, 38, 40-44, 48-54, 56, 59, 61, 63-65, and 69-95 remain in this application. Claims 40, 48, 61, 69, 73-77, and 79-83 have been withdrawn from consideration. New claims 96-98 are added without adding any new matter.

Claims 35, 38, 41, 42, 43, 44, 49-54, 56, 59, 63-65, 70-72, 78 and 84-92 were rejected under 35 USC 112, first paragraph as failing to comply with the enablement requirement. For the following reasons, these rejections are respectfully traversed.

In a telephone interview conducted with the Examiner on April 28, 2010, the Examiner indicated that adding a feature of utilizing a threshold value to the claims, including language that the data measurement process is regularly performed as the items are transported, and providing a statement by the inventor as to how the threshold can be determined, would be useful in overcoming these rejections.

Accordingly, the claims have been amended to recite the use of a threshold value by comparing differences between subsequent differences between data sets to the threshold to determine a boundary condition. See, for example, claim 35 which recites the step of "analyzing said difference between successive data sets for comparison against a *threshold* for identifying the boundary between the consecutively abutting items, wherein said boundary is determined when said difference is greater than said *threshold*" (emphasis added). Claims 56, 86, 86, 90, and new claim 93 recite similar features.

Also, claim 35 has been amended to recite the step of "measuring a plurality of successive data sets each comprising a plurality of at least one characteristic of each item measured with the measuring means, with said *successive data sets being taken at*

intervals across a length of said items" (emphasis added). The italicized portion of the claim satisfies the Examiner's request that the claim recite regular data collection/analysis. Claims 56, 86, 86, 90, and new claim 93 recite similar features.

Furthermore, attached to this response is a statement by one of the inventors regarding the practice of the invention and including a discussion of determining threshold values.

Claims 86-92 are rejected under 35 USC 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims have been amended to remove the language cited by the Examiner , making the rejections moot.

Consequently, the rejections should be withdrawn as the provided amendments and statements satisfy the recommendations provided by the Examiner in the telephone interview.

In consideration of the foregoing analysis, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. SCAN1-41081.

Respectfully submitted,
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Roenne
May the 8th 2010

To whom it may concern

The function of Boundary detection

We have been using boundary detection on our I-Cut 55 (previously called the B55) since spring 2004.

The invention does increase the accuracy of the last portions significantly. The reason for this is that the boundary detection allows the operator to place the meat close together, so that the meat will form an "endless" row, and provide excellent support during the cutting.

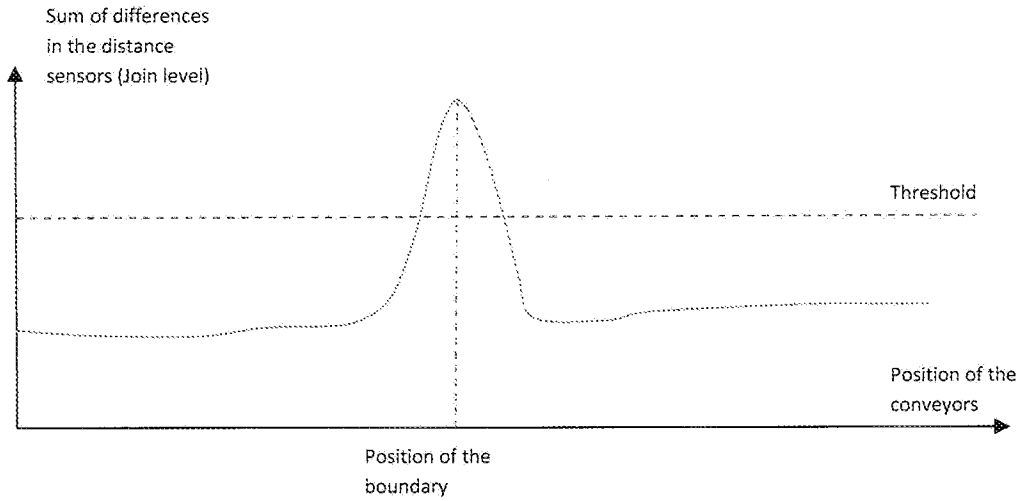
For example, when using boundary detection for cutting pork-loins into chops, all chops can achieve the correct weight, leaving only a piece of trim weighing less than a chop in the end. If we don't use the boundary detection, the last 2 or 3 chops will be off weight. Since the target weight of the chops often are different, depending on where the chops are taken (neck-end, center and ham-end), it is essential to know where one pork-loin ends and the next pork-loin begins.

We have used the invention in 2 versions: one where a so called ring-sensor is used and a second version where a setup with 3 cameras is used. The description below is based on the "ring-sensor", because the description in the patent application is based on this.

<u>The way boundary detection is used, to detect the boundary between 2 porkloins, using a ring-sensor.</u>

The ring-sensor is 24 distance-sensors arranged in a circle surrounding the meat. The plan of the circle is situated in a gap between 2 conveyors, and the plan is perpendicular to the directions of the conveyors. The center of the circle is chosen so that it corresponds with the center of the majority of the meat. The main reason for the ring sensor is to provide data for measuring the volume of the meat. But the same measurements are also used, to detect the boundary between two pieces of meat.

Each of the distance sensors will transmit a distance to the control-unit every 24 msec., the resolution of the measurement is 1/10 of a millimeter. The control system remembers the previous scanning's, for each of the 24 measurements, the difference (integer) between the previous and the present scanning is calculated and finally all 24 integer values are added together. When this sum exceeds a threshold, the boundary is about to come, the actual boundary is determined as the point where the highest sum of differences is measured.



To help the operator finding the correct value the human to machine interface has a function to read out the sum of differences. The following is a quote from the user manual:

Join items: *0000-0100, this value is used to let the items run close so that they can support each other.*
If "0000" is entered the function is disabled.
If a value between "0001" and "0100" is entered, the function is that the items (raw products) are placed with distance on the in-feed conveyor, right after scanning has ended on an item the conveyor between the scanner and the knife is stopped until the next item enter the scanner, the items are compressed the same amount of mm as entered.
If a value between "0100" and "9999" is entered you can place the raw material close and let the PortionCutter find the boundary between the items, the value indicates how big change in scanning that is necessary to detect a boundary.
To find a suitable value, activate the function by setting the value higher than "0100" and look at "data view" page 1, where a value "Join Level" now is present, the values showed is sum of changes in all 24 sensors in the ring sensor. The left value is showing the peaks (highest level in the last 2 sec.) the value to the right is showing value right now. A suitable value is a value that is between the peaks (the boundaries) and normal values (in the middle of the items). If you press directly on "Join Level" the right value will show the selected level in "Join item".

When monitoring the when cutting pork-loin at normal speed of the conveyors, we have found that the level is below 500 units in the middle of the meat, and the peak point (where the actual boundary is) is from 1500-2000 units. For cutting pork chops, 1000 units are determined to be a suitable value for "Join Level".

Things that influence the setup of the boundary detection

- The form of the meat. Different types of meat will have different shapes and therefore it will need different threshold values.
- The speed of the conveyors;
    - If the speed of the belt is increased the distance between each scan will also increase. There is a risk of totally overlook the boundary at high speed of the conveyors, simply because the boundary is situated between 2 scanning's.
    - If the speed is very low the difference between 2 scanning's might not be big enough to detect a boundary.

Product's here boundary detection have been proven to be effective:

In general boundary detection is used, where the portions cut from the food-material is high compared to the thickness, and therefore there is a risk that the material will move or tilt, when the last portions are cut:

- Pork loin
- Strip-loin red meat
- Sirloin (topbutt) red meat
- Sausages
- Turkey breast
- Various cheeses
- Etc.

In general boundary detection is not used, if the nature of the product will result in portions, which do not have a tendency of tilting, when making the last cut:

- Tenderloin, Pork and beef
- Fish filets
- Chicken filets

To my knowledge, the only application where boundary detection has failed is for a cheese application where the cheeses were "perfect" cylinders.

Gorm Sørensen
Product manager - Portioning